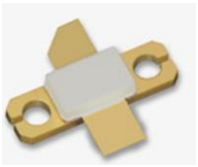
Gallium Nitride 28V 15W, RF Power Transistor

Description

The GTAH58015GX is a 15W,internally matched GaN HEMT,designed for multiple applications, especially sub-6GHz LTE/LTE-A/LTE-U from 4500-5900MHz.

There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

GTAH58015GX



- Typical performance (on narrow band fixture with device soldered)

V_{DD}=28V I_{DQ}=110mA, Pulse CW, Pulse width=20uS, Duty cycle=20%.

Frequency(MHz)	Gp (dB)	P_{SAT}(W)	Efficiency (%)
5725	13.9	18.6	57.6
5800	14.4	19.5	64.3
5925	14.6	17.0	57.1

- Typical performance (on narrow band fixture with device soldered)

VDD = 28 Volts, IDQ = 110 mA, Test signal: WCDMA, 3GPP test model 1; 1 to 64 DPCH; Channel Bandwidth=3.84MHz,PAR =10.5 dB at 0.01 % probability on CCDF.

Frequency (MHz)	$P_{L(AV)}$ (W)	Gp (dB)	η_D (%)	$ACPR_{5M}$ (dBc)
5725	2	13.6	23.8	-40.8
5800	2	14.0	26.4	-41.2
5925	2	14.1	25.3	-41.1

Applications and Features

- Suitable for wireless communication infrastructure, wideband amplifier, EMC testing, ISM etc.
- High Efficiency and Linear Gain Operations
- Thermally Enhanced Industry Standard Package
- High Reliability Metallization Process
- Excellent thermal Stability and Excellent Ruggedness
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

1. Set VGS to the pinch--off (VP) voltage, typically –5 V
2. Turn on VDS to nominal supply voltage (28V)
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

Turning the device OFF

1. Turn RF power off
2. Reduce VGS down to VP, typically –5 V
3. Reduce VDS down to 0 V
4. Turn off VGS

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	40	Vdc
Maximum Forward Gate Current @ Tc = 25°C	Igmax	4	mA

Storage Temperature Range	T_{stg}	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature(See note 1)	T_J	+200	°C
Total Device Power Dissipation (Derated above 25°C, see note 2)	Pdiss	31	W

Note: 1. Continuous operation at maximum junction temperature will affect MTTF
2.Bias Conditions should also satisfy the following expression: Pdiss < (Tj – Tc) / RJC and Tc = Tcase

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, T_J=200°C, RF CW operation	$R_{\theta JC}$	5.67	C/W

Table 3. Electrical Characteristics (T_C = 25℃ unless otherwise noted)

DC Characteristics

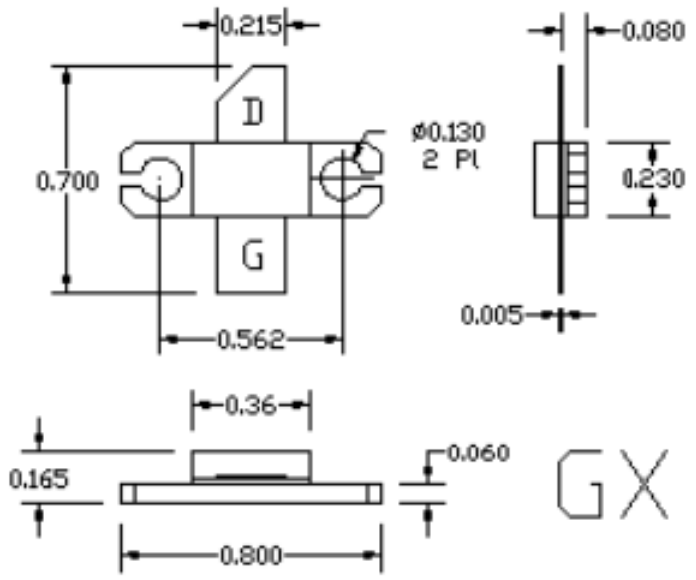
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=4mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D = 4mA	V_{GS}(th)		-2.7		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=110mA, Measured in Functional Test	$V_{GS(Q)}$		-2.4		V

Functional Tests (In 5.7-5.9GHz Production Test Fixture, 50 ohm system) :V_{DD} = 28 Vdc, I_{DQ} = 110 mA, f = 5800 MHz, WCDMA signal, Pout=2W

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	Gp		14		dB
Drain Efficiency @ P_{SAT}	Eff		26		%
Saturated Power by CCDF test	P_{SAT}	15			W
Input Return Loss	IRL		-10		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		Ψ

Package Outline

Flanged ceramic package; 2 leads



Tolerance .XX +/-0.01 .XXX +/-.005 inches

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-G2E					03/12/2013

Figure 1. Package Outline PKG-G2E

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2017/4/27	V1.0	Preliminary Datasheet Creation
2017/5/25	V1.1	Preliminary Datasheet
2017/6/20	V1.2	Modification on maximum rating

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